

REMARKS

In the outstanding Office Action, the Examiner rejected claims 9-16 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,472,735 to Isaak ("Isaak").

By this amendment, Applicant has amended claim 9. Claims 1-18 remain pending in this application, with claims 9-16 presented for examination.

Regarding the rejection of claims 9-16 under 35 U.S.C. § 102(e), Applicant disagrees with the Examiner's assertions and conclusions as set forth in the outstanding Office Action.¹ "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference ... [t]he identical invention must be shown in as complete detail as is contained in the . . . claim." MPEP § 2131 8th Ed. (Rev. 4), October, 2005 (internal citations omitted). Because Isaak fails to teach each and every element recited in claims 9-16, Applicant respectfully traverses this rejection.

For example, Isaak fails to teach at least "a first connection portion spaced from the first connection terminals and not electrically connected to any terminal of the integrated circuit chip," as recited in claim 9. At page 3 of the Office Action, the Examiner has labeled and characterized a portion of Figure 4 of Isaak as allegedly illustrating a "connection portion (26) as not being electrically connected." The Examiner has thus apparently characterized either of these two specific base pads 26 of Isaak as constituting Applicant's claimed "a first connection portion ... not electrically

¹ The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement of characterization in the Office Action.

connected to any terminal of the integrated circuit chip,” as recited in claim 9. Applicant respectfully disagree with the Examiner’s characterization of Isaak.

Isaak teaches a base substrate having a first conductive pattern comprising “a first set of base pads 24 and a second set of base pads 26 which are each disposed on the top surface of the base substrate 14,” (col. 7, lines 31-36) wherein “base pads 24 of the first set are electrically connected to respective ones of the first base pads [26] of the second set via conductive traces 28” (col. 7, lines 41-43, emphasis added). Isaak further teaches that “[t]he conductive contacts 82 of each of the integrated circuit chips 70 are electrically connected to respective ones of the first base pads 24” (col. 10 lines 58-60, emphasis added). Accordingly, because base pads 24 are electrically connected to base pads 26, and conductive contacts 82 of the integrated circuit chips 70 are electrically connected to base pads 24, it follows that conductive contacts 82 are also electrically connected to base pads 26. Thus, Isaak fails to provide a teaching of base pads 26 “not electrically connected to any terminal of the integrated circuit chip,” as recited in claim 9.

Moreover, Isaak illustrates in Figure 4 transposer layer 52, having a third conductive pattern including transposer pads 64 and 66 wherein a trace between transposer pads 64 appears to electrically connect corner transposer pads 64. Because Isaak also teaches that “the first conductive pattern of one of the base layers 12 ... is electrically connected to the third conductive pattern of the transposer layer 52,” (col. 9, lines 62-65) the base pads 26 alleged by the Examiner as not being electrically connected to the integrated circuit chip, are in fact electrically connected by at least the traces connecting corner transposer pads 64, as shown in Figure 4 of Isaak. Isaak thus

fails to teach a combination including “a first connection portion spaced from the first connection terminals and not electrically connected to any terminal of the integrated circuit chip,” as recited in claim 9. For at least the same reasons, Isaak also fails to teach “a metal material portion ... not electrically connected to any terminal of the integrated circuit chip,” as also recited in claim 9.

Claim 9, as amended, also recites a combination including “the first connection terminals being electrically connected to the second connection terminals, the electrical connection between the first connection terminals and the second connection terminals not being provided by thermal compression bonding.” Isaak teaches “anisotropic epoxy 49 is dispensed (if a liquid) or placed (if a film) between respective opposing coaxially aligned sets of the base and frame pads 26, 30, 44, 46, with heat and pressure ... thus forming a conductive conduit therebetween.” Because Isaak teaches that the conductive conduit is formed using “heat and pressure,” it appears that Isaak uses a thermo compression binding technique to establish an electrical connection at base and frame pads 26, 30, 44, and 46. This cannot constitute a teaching of “the first connection terminals being electrically connected to the second connection terminals, the electrical connection between the first connection terminals and the second connection terminals not being provided by thermal compression bonding,” as recited in amended claim 9 (emphasis added).

Claim 9, as amended, also recites a combination including at least “a metal material portion provided between the first connection portion and the second connection portion, bonding the first connection portion to the second connection portion and not electrically connected to any terminal of the integrated circuit chip, the

first connection portion being bonded to the second connection portion by thermo compression bonding; and the first connection terminals being electrically connected to the second connection terminals, the electrical connection between the first connection terminals and the second connection terminals not being provided by thermal compression bonding.” That is, “the first connection portion and the second connection portion” are bonded using thermo compression bonding, and the “first connection terminals are electrically connected to the second connection terminals,” using bonding different than thermo compression bonding.

Consistent with the present invention, a first connection portion and a second connection portion are used to physically connect a first substrate and a second substrate. Therefore, the first connection portion and the second connection portion must be bonded together firmly. On the other hand, first connection terminals and second connection terminals are used for electrical connection, and do not need to be connected securely.

In thermo compression bonding, a metal material portion is melted by heating, and the molten metal material portion is used for bonding, enabling firm, secure bonding (see, e.g., Applicant’s specification at, for example, page 11, lines 8-23). Consistent with the present invention, the first connection portion and the second connection portion are bonded by thermo compression bonding, and therefore, the first substrate and the second substrate are physically connected in an extremely firm state. However, a heater or a heater controller is required, since metal material is melted by heating, in thermo compression bonding. Accordingly, if thermo compression bonding were used

for connecting a number of first connection terminals and second connection terminals, one would require a bonding device that is complex and expensive.

Thus, consistent with the present invention, thermo compression bonding is used only to connect the first connection portion and the second connection portion. The first connection terminals and the second connection terminals are not connected using thermo compression bonding. Accordingly, in the present invention, the first substrate and the second substrate can be connected (bonded) firmly without use of a complex and expensive bonding device.

Isaak fails to teach at least “the first connection portion being bonded to the second connection portion by thermo compression bonding; and the first connection terminals being electrically connected to the second connection terminals, the electrical connection between the first connection terminals and the second connection terminals not being provided by thermal compression bonding,” as recited in claim 9. FIG. 4 of Isaak shows a pad 26 (corresponding to the first connection terminals), which is connected to a via conductive trace 28, and two pads 26 (corresponding to first connection portion), which are not connected to the via conductive trace 28. However, with Isaak, it appears that all pads 26 (including the pad 26 connected to the via conductive trace 28 and the two pads 26 not connected to the via conductive trace 28) are connected to pads 44 (corresponding to the second connection terminals and the second connection portion) by the same connection method (bonding method).

Accordingly, Isaak fails to teach at least “the first connection portion being bonded to the second connection portion by thermo compression bonding; and the first connection terminals being electrically connected to the second connection terminals,

the electrical connection between the first connection terminals and the second connection terminals not being provided by thermal compression bonding," as recited in claim 9.

For at least the foregoing reasons, Applicant respectfully submits that Isaak fails to teach each and every element of claim 9. Claim 9 is thus allowable over Isaak and claims 10-16 are allowable at least due to their dependence on claim 9. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claim 9 under 35 U.S.C. § 102(e).

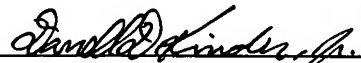
In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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